# Human Factors — Index to Volume 9

## TABLE OF CONTENTS

### NUMBER 1, FEBRUARY 1967


| | Page |
|---|---|
| On the Building of Bridges<br>Ezra V. Saul | 1 |
| Image Quality and Target Recognition<br>Corwin A. Bennett, Samuel H. Winterstein, and Robert E. Kent | 5 |
| Recognition of Lunar Craters<br>James Wilde, Jerome Siegel, and James Williams | 33 |
| Individual and Two-Man Team Target Finding Performance<br>John P. Hornseth and James H. Davis | 39 |
| An Evaluation of Four Methods of Monitoring Simultaneous Primary and Secondary Voice Messages<br>William E. Williams and Donald D. Young | 45 |
| A Model For a Series Processing System<br>Wellington E. Smith | 53 |
| An Information Processing Model of the Aircraft Accident Investigator<br>Myron L. Braunstein and Orel F. Coleman | 61 |
| The Utilization of Human Factors Information by Designers<br>David Meister and Donald E. Farr | 71 |
| The Authors | 89 |


### NUMBER 2, APRIL 1967


| | Page |
|---|---|
| Performance Effects of Long Term Random Vertical Vibration<br>Clarence L. Holland | 93 |
| An Experimental Study of Image Motion Compensation Tracking for Earth Reconnaissance from Space<br>Michael L. Hershberger | 105 |
| Tests of Ten Control-Display Linkages<br>Alphonse Chapanis and Donald A. Mankin | 119 |
| Tracking Performance with Advanced and Delayed Visual Displays<br>Robert N. Gifford and John Lyman | 127 |
| Skill Acquisition in Multi-Dimensional Manipulator Control<br>Gershon Weltman, Aharon Nachson and Hilde Groth | 133 |
| The Human Controller as an Adaptive, Low-Pass Filter<br>Gordon H. Robinson | 141 |
| Aerospace Simulation and Human Performance Research<br>William B. Knowles, Jr. | 149 |
| The Impact of Microelectronics on the Utilization and Training of Maintenance Personnel<br>Douglas H. Harris | 161 |
| The Effect of Color Coding Indicator Displays on Dark Adaptation<br>Richard M. Carr | 175 |
| Report on Automated Human Factors Task Data Handling Research<br>Lawrence E. Reed and Fred H. Wise | 181 |
| Erratum | 186 |
| The Authors | 187 |


### NUMBER 3, JUNE 1967


| | Page |
|---|---|
| The Effects of Divided Attention on Visual Monitoring of Multichannel Displays<br>John D. Gould and Amy Schaffer | 191 |
| Human Performance in the Cold<br>William F. Fox | 203 |
| Human Operator Response Speed, Frequency and Flexibility: A Review and Analysis<br>Michael J. Wargo | 221 |
| Effectiveness of Side-Looking Radar in Simulated Orbit as a Function of Reference Data Support<br>Hugh E. Cahill and Robert S. Luce | 239 |
| Computer-Aided Instruction as a Part of a Management Information System<br>Charles S. Morrill | 251 |
| The Effect of Conflicting Instructions and Feedback Specificity on Tactical Decision Performance<br>Robert C. Kinkade and Maurice P. Ranc | 257 |
| Human Estimates of Randomly Perturbed Functional Values<br>William A. Hillix, Edgar L. Kapfer, Jr., and Ramon L. Hershman | 263 |
| The Effects of Differential Value on the Recall of Realistic Targets<br>Richard E. Christ and Warren H. Teichner | 273 |
| The Effects of Ambient Noise Upon Signal Detection<br>Angelo Mirabella and Donald A. Goldstein | 277 |
| Signal Detection Theory in the Analysis of Human Vigilance<br>Harry J. Jerison | 285 |
| The Authors | 289 |


### NUMBER 4, AUGUST 1967


| | Page |
|---|---|
| Linear Programming Applied to Optimization of Instrument Panel and Workplace Layout<br>Louis E. Freund and Thomas L. Sadosky | 295 |
| The Relationship of Near-Vision Peripheral Acuity and Far-vision Search Performance<br>Dorothy M. Johnston | 301 |
| Flight Controllers for Jet Transports<br>William B. Knowles | 305 |
| Using the Null Hypothesis in Human Engineering Evaluations<br>Newton C. Ellis | 321 |
| Conference Proceedings: Assessment of Complex Operator Performance<br>Special Editor: W. Dean Chiles | |
| Methodology in the Assessment of Complex Performance: Introduction<br>W. Dean Chiles | 325 |

Page

WHAT DOES THE OPERATOR DO IN COMPLEX SYSTEMS
Julien M. Christensen and Robert G. Mills 329

THE USE OF FULL SCALE MISSION SIMULATION FOR THE ASSESSMENT OF COMPLEX OPERATOR PERFORMANCE
Milton A. Grodsky 341

PERFORMANCE ASSESSMENT BASED ON AN EMPIRICALLY DERIVED TAXONOMY
Edwin A. Fleishman 349

THE IDENTIFICATION OF PERFORMANCE DIMENSIONS THROUGH FACTOR ANALYSIS
James F. Parker, Jr. 367

METHODOLOGY IN THE USE OF SYNTHETIC TASKS TO ASSESS COMPLEX PERFORMANCE
Earl A. Alluisi 375

METHODOLOGY IN THE ASSESSMENT OF COMPLEX PERFORMANCE: DISCUSSION AND CONCLUSIONS
W. Dean Chiles 385

THE AUTHORS 393

**NUMBER 5, OCTOBER 1967**

CROSS-ADAPTIVE OPERATOR LOADING TASKS
Charles R. Kelley and Michael J. Wargo 395

VISUAL CODING USING FLASHING LIGHTS
Donald A. Goldstein and Jerry C. Lamb 405

EFFECT OF REDUCED PRESSURE ON HUMAN PERFORMANCE
Joseph L. Seminara, Richard J. Shavelson and Stuart O. Parsons 409

READABILITY OF DIALS AT DIFFERENT DISTANCES WITH CONSTANT VISUAL ANGLE
Alphonse Chapanis and Lorraine C. Scarpa 419

DRIVING PERFORMANCE UNDER NIGHTTIME CONDITIONS OF VISUAL DEGRADATION
Francisco Matanzo, Jr. and Thomas H. Rockwell 427

APPLICATION OF SERVO THEORY TO A MANUAL REPETITIVE OPERATION
Charles W. Suggs 433

CONFUSION MATRIX ANALYSIS FOR FORM PERCEPTION
Raymond D. Engstrand and George Moeller 439

JUDGMENTS OF RELATIVE DISTANCE BASED ON SEPARATE 2-D TV VIEWS
Billy M. Crawford and William N. Kama 447

LEGIBILITY OF NUMBERS AS A FUNCTION OF CONTRAST AND ILLUMINATION
Charles M. Williams 455

DISPLAY-CONTROL RELATIONSHIPS WITH BISENSORY SIGNALS
A. Douglas Perriment and William R. Webster 461

THE EFFECTS OF SYMBOL FREQUENCY IN LEGIBILITY TESTING
Glennis L. Bell 471

THE THUMBWHEEL SWITCH AS A DATA ENTRY DEVICE
Dean W. Plath and Peter E. Kolesnik 479

Page

TACTUAL CODING OF CYLINDRICAL KNOBS
James V. Bradley 483

THE SUBJECTIVE RESPONSE TO THE THERMAL ENVIRONMENT
Warren H. Teichner 497

ERRATA
Walter W. Wierwille 510

THE AUTHORS 511

**NUMBER 6, DECEMBER 1967**

HUMAN RESOURCES ENGINEERING: A NEW CHALLENGE
Gordon A. Eckstrand, William B. Askren, and Melvin T. Snyder 517

MAN-COMPUTER COMMUNICATION TECHNIQUES: TWO EXPERIMENTS
Robert T. Root and Robert Sadacca

A MODEL FOR THE PERCEPTION OF MORSE CODE-LIKE SIGNALS
Myron Wish 529

PREDICTING THE DECISION BEHAVIOR OF A KNOWLEDGEABLE OPPONENT
Raymond C. Sidorsky 541

---

PREFACE TO THE SPECIAL WORK PHYSIOLOGY SECTION
Laurence E. Morehouse 555

ENERGISTIC EFFECTS OF TASK SEQUENCING
Richard B. Chase 557

ENERGY EXPENDITURES AND FATIGUE DURING SIMPLE REPETITIVE TASKS
William R. Pierson and George Q. Rich 563

CONTINUOUS RECORDING OF CARDIAC AND RESPIRATORY FUNCTIONS IN NORMAL AND HANDICAPPED PEOPLE
Lucien Brouha and Hans Krobath 567

THE RELATIVE ENERGISTIC EFFICIENCIES OF ONE-ARMED AND TWO-ARMED WORK
Robert B. Andrews 573

ESTIMATION OF VALUES OF ENERGY EXPENDITURE RATE FROM OBSERVED VALUES OF HEART RATE
Robert B. Andrews 581

ABBREVIATED METHODS FOR THE MEASUREMENT OF OXYGEN CONSUMPTION IN WORK PHYSIOLOGY
Mary E. Maxfield and Paul E. Smith, Jr. 587

URINARY MUCOPROTEIN EXCRETION IN PHYSICAL EXERCISE
Francis N. Dukes-Dobos, Robert G. Keenan, and Thomas J. Carlow 595

METHODS FOR STUDYING ENERGY COSTS AND ENERGY FLOW DURING HUMAN LOCOMOTION
L. Lukin, M. J. Polissar, and H. J.Ralston 603

THE AUTHORS 609

INDEX TO VOLUME 9 613

## AUTHOR INDEX


| | Page |
|---|---|
| Alluisi, Earl A. | 375 |
| Andrews, Robert B. | 573, 581 |
| Askren, William B. | 517 |
| Bell, Glennis L. | 471 |
| Bennett, Corwin A. | 5 |
| Bradley, James V. | 483 |
| Braunstein, Myron L. | 61 |
| Brouha, Lucien | 567 |
| Cahill, Hugh E. | 239 |
| Carlow, Thomas J. | 595 |
| Carr, Richard M. | 175 |
| Chapanis, Alphonse | 119, 419 |
| Chase, Richard B. | 557 |
| Chiles, W. Dean | 325, 385 |
| Christ, Richard E. | 273 |
| Christensen, Julien M. | 329 |
| Coleman, Orel F. | 61 |
| Crawford, Billy M. | 447 |
| Davis, James H. | 39 |
| Dukes-Dobos, Francis N. | 595 |
| Eckstrand, Gordon A. | 517 |
| Ellis, Newton C. | 321 |
| Engstrand, Raymond D. | 439 |
| Farr, Donald E. | 71 |
| Fleishman, Edwin A. | 349 |
| Fox, William F. | 203 |
| Freund, Louis E. | 295 |
| Gifford, Robert N. | 127 |
| Goldstein, Donald A. | 277, 405 |
| Gould, John D. | 191 |
| Grodsky, Milton A. | 341 |
| Groth, Hilde | 133 |
| Hershman, Ramon L. | 263 |
| Hillix, William A. | 263 |
| Harris, Douglas H. | 161 |
| Hershberger, Michael L. | 105 |
| Holland, Clarence L. | 93 |
| Hornseth, John P. | 39 |
| Jerison, Harry J. | 285 |
| Johnston, Dorothy M. | 301 |
| Kapfer, Jr., Edgar L. | 263 |
| Kama, William N. | 447 |
| Keenan, Robert G. | 595 |
| Kelley, Charles R. | 395 |
| Kent, Robert E. | 5 |
| Kinkade, Robert C. | 257 |
| Knowles, Jr., William B. | 149, 305 |
| Kolesnik, Peter E. | 479 |
| Krobath, Hans | 567 |
| Lamb, Jerry C. | 405 |
| Luce, Robert S. | 239 |
| Lukin, L. | 603 |
| Lyman, John | 127 |
| Mankin, Donald A. | 119 |
| Matanzo, Jr., Francisco | 427 |
| Maxfield, Mary E. | 587 |
| Meister, David | 71 |
| Mills, Robert G. | 329 |
| Mirabella, Angelo | 277 |
| Moeller, George | 439 |
| Morehouse, Laurence E. | 555 |
| Morrill, Charles S. | 251 |
| Nachson, Aharon | 133 |
| Parker, Jr., James F. | 367 |
| Parsons, Stuart O. | 409 |
| Perriment, A. Douglas | 461 |
| Pierson, William R. | 563 |
| Plath, Dean W. | 479 |
| Polissar, M. J. | 603 |
| Ralston, H. J. | 603 |
| Ranc, Maurice P. | 257 |
| Reed, Lawrence E. | 181 |
| Rich, George Q. | 563 |
| Robinson, Gordon H. | 141 |
| Rockwell, Thomas H. | 427 |
| Root, Robert T. | 521 |
| Sadacca, Robert | 521 |
| Sadosky, Thomas L. | 295 |
| Saul, Ezra V. | 1 |
| Scarpa, Lorraine C. | 419 |
| Schaffer, Amy | 191 |
| Seminara, Joseph L. | 409 |
| Shavelson, Richard J. | 409 |
| Sidorsky, Raymond C. | 541 |
| Siegel, Jerome | 33 |
| Smith, Wellington E. | 53 |
| Smith, Jr., Paul E. | 587 |
| Snyder, Melvin T. | 517 |
| Suggs, Charles W. | 433 |
| Teichner, Warren H. | 273, 497 |
| Wargo, Michael J. | 221, 395 |
| Webster, William R. | 461 |
| Weltman, Gershon | 133 |
| Wierwille, Walter W. | 510 |
| Wilde, James | 33 |
| Williams, Charles M. | 455 |
| Williams, James | 33 |
| Williams, William E. | 45 |
| Winterstein, Samuel H. | 5 |
| Wise, Fred H. | 181 |
| Wish, Myron | 529 |
| Young, Donald D. | 45 |

## SUBJECT INDEX


| | Page |
|---|---|
| Acuity, peripheral and search performance | 301 |
| Adaptation, dark, and display color coding | 175 |
| Adaptive | |
| filter, human controller as | 141 |
| tasks, cross-adaptive and loading | 395 |
| AESOP (An Evolutionary System for On-Line Processing) | 251 |
| Aircraft | |
| accident investigation | 61 |
| aerial photographs, target recognition | 5 |
| controllers, flight | 305 |
| controls, thumbwheel switch | 479 |
| instrument panel layout | 295 |
| jet transport | 305 |
| research applications | 5, 39 |
| safety research | 61 |
| Alarm, visual flashing lights | 405 |
| Alphanumerics | |
| confusion matrices | 439, 471 |
| estimation and visual noise | 264 |
| monitoring multi-channel displays | 191 |
| number legibility | 455 |
| symbol frequency | 471 |
| Ambient lighting sonar displays | 175 |
| Apollo pressure suit | 409 |
| Attention | |
| and multi-channel displays | 191 |
| in signal detection tasks | 285 |
| Audition | |
| ambient noise and signal detection | 277 |
| Morse Code-like signals | 529 |
| noise and monitoring | 45 |
| simultaneous voice messages | 45 |
| and vision, bi-sensory signals | 461 |
| Automated task data handling | 181 |
| Automobile driver performance | 427 |
| Bisensory signals, display-control relationships | 461 |
| Brightness, effect on legibility | 471 |
| Coding | |
| color, sonar equipment | 175 |
| tactual | 483 |
| visual, flashing lights | 405 |
| Cold and human performance | 203 |
| Color coding, sonar equipment | 175 |
| Comfort-Thermal Balance | 497 |
| Command and control | |
| management information system | 251 |
| tactical decision making | 251,541 |
| Communication, man-computer (see also Computers) | 523 |
| Complex behavior assessment, Special Issue | 325 |
| Computers | |
| application to workplace layout | 295 |
| automated human factors task data handling | 181 |
| computer-aided instruction | 251 |
| computer-aided tracking | 105 |
| management applications | 251 |
| man-computer communication | 521 |
| thumbwheel switch for data entry | 479 |
| Confusion matrix analysis | 439, 471 |
| Contrast | |
| and legibility testing | 471 |
| and number legibility | 455 |
| Controls | |
| aircraft | 305, 479 |
| —display linkage evaluation | 119 |
| dynamics and reconnaissance | 105 |
| flight | 305 |
| knobs | 483 |
| layout | 295 |
| manual speed, frequency and flexibility | 221 |
| multi-dimensional manipulator | 133 |
| one-armed and two-armed work | 573 |
| position, and bisensory signals | 461 |
| sequential | 479 |
| shape effect | 483 |
| thumbwheel switch | 479 |
| two and three dimensions | 133 |
| Cross-adaptive tasks | 395 |
| Dark adaptation, and display color coding | 175 |
| Data entry devices | |
| man-computer communication | 521 |
| thumbwheel switch | 479 |
| Decision making | |
| feedback effect | 257 |
| one and two-men teams | 39 |
| tactical | 257, 541 |
| Design | |
| and human factors information | 71 |
| and human resources engineering | 517 |
| Dials, readability and viewing distance | 419 |
| Display-control relationships | |
| with bi-sensory signals | 461 |
| tests of ten linkages | 119 |
| Displays | |
| advanced and delayed | 127 |
| color coded, sonar | 175 |
| contrast and illumination | 455 |
| for computer-aided instruction | 251 |
| for cross-adaptive loading tasks | 395 |
| devices to increase response speed | 221 |
| human operator response | 230 |
| image motion compensation | 105 |
| layout by linear programming | 295 |
| multi-channel visual | 191 |
| readability, size and distance | 419 |
| target recall | 273 |
| weather symbols | 471 |
| See also Alphanumerics | |
| Distance judgment | 447 |
| Driver performance, nighttime conditions | 427 |
| Environment | |
| cold and human performance | 203 |
| noise, and voice messages | 45 |

| | Page |
|---|---|
| reduced pressure, and performance | 409 |
| severe, performance review | 203 |
| thermal | 497 |
| vibration | 93 |
| Equipment design, human factors criteria in | 71 |
| Estimation | 263 |
| Eye movement, and instrument layout | 299 |
| Factor analysis applications | 349, 367 |
| Fatigue and energy expenditure | 563 |
| Feedback and decision making | 257 |
| Filtering auditory signals | 141 |
| Flash rate, visual signals | 405 |
| Flight controllers, jet transports | 305 |
| Gloves | |
| cold and human performance | 203 |
| and tactual knob coding | 483 |
| and thumbwheel data entry | 479 |
| Group performance, and target finding | 39 |
| Heat, subjective response to | 497 |
| Human engineering and null hypothesis | 321 |
| Human factors information | |
| automated task data handling | 181 |
| and design | 71 |
| and human resources engineering | 517 |
| Human Factors Society, presidential address | 1 |
| Human resources engineering | 517 |
| Illumination | |
| and automobile driving | 427 |
| contrast and number legibility | 455 |
| and legibility testing | 471 |
| sonar displays | 175 |
| Image quality and target recognition | 5 |
| Information systems | |
| management | 251 |
| tactical decision making | 257 |
| Information transfer rate, bisensory signals | 461 |
| Instruction, computer-aided | 251 |
| Instruments (see Aircraft; Displays; Space Systems) | |
| Jet transport controls | 305 |
| Judgment, distance difference | 447 |
| Knobs, tactual coding | 483 |
| Language applications | 439 |
| Layout, workplace | |
| controls, and bi-sensory signals | 461 |
| linear programming | 295 |
| tests of 10 control-display linkages | 119 |
| Legibility | |
| contrast and illumination | 455 |
| symbol brightness and frequency | 471 |
| Lighting | |
| contrast, illumination and number legibility | 455 |
| dark adaptation | 175 |
| sonar signal detection | 175 |
| Linear programming and workplace layout | 295 |
| Linkage, control-display evaluation | 119 |
| Literature reviews (see Reviews, Literature) | |
| Load | |
| auditory messages | 45 |
| cross-adaptive tasks | 395 |
| Lunar craters, recognition | 33 |
| Maintenance | |
| burden analysis | 161 |
| and microelectronics | 161 |
| tasks under reduced pressure | 411 |
| training for | 161 |
| Management information systems | 251 |
| Manual control speed, frequency, and flexibility | 221 |
| Manufacturing | |
| applications | 433 |
| operator effectiveness | 53 |
| model | 53 |
| Measurement | |
| in aerospace simulation | 153 |
| assessment of complex performance, Special Issue | 325 |
| caloric values in task sequencing | 557 |
| cardiac and respiratory functions | 567 |
| confusion matrix analysis | 439 |
| cross-correlation | 129 |
| energy costs and flow | 603 |
| energy expenditure from heart rate | 581 |
| factor analysis | 349, 367 |
| in man-computer studies | 523 |
| oxygen consumption, methods | 587 |
| secondary tasks | 395 |
| urinary mucoprotein excretion | 595 |
| work physiology, Special Issue | 555 |
| Memory | 273 |
| Methodology | |
| assessment of complex performance | 325, 385 |
| automated human factors task data handling | 181 |
| null hypothesis in human engineering research | 321 |
| use of human factors information | 71 |
| Microelectronics and maintenance personnel | 161 |
| Mockups, cockpit | 305 |
| Models (and Theory) | |
| aircraft accident investigator | 61 |
| Comfort-Thermal Balance | 497 |
| Constant Ratio Rule (CRR) | 439 |
| energy costs and flow during human locomotion | 603 |
| game theory in tactical decision making | 541 |
| human as low pass filter | 141 |
| human estimator | 263 |
| information transfer rate | 461 |
| linear programming and workplace layout | 295 |
| manual repetitive operation | 433 |
| manufacturing process | 53 |
| perception of Morse Code-like signals | 529 |
| series processing system | 53 |
| signal detectability theory | 285 |

| | Page |
|---|---|
| tactical decision making | 257, 541 |
| thermal environment, subjective response to | 497 |
| Monitoring (see Vigilance) | |
| Morse Code | 529 |
| Multidimensional skill acquisition | 133 |
| Noise, auditory | |
| and signal detection | 277 |
| and voice messages | 45 |
| Noise, visual, and human estimation | 263 |
| Null hypothesis in human engineering research | 321 |
| Operational systems, human performance in | 329 |
| Operator effectiveness in manufacturing | 53 |
| Organization and planned change | 1 |
| Payoff functions (see Utility) | |
| Performance, complex | |
| assessment of, Special Issue | 325 |
| and cold | 203 |
| cross-adaptive tasks | 395 |
| factor analysis methods | 349, 367 |
| research review | 149 |
| synthetic tasks to assess | 375 |
| Personnel subsystem | |
| and human resources engineering | 517 |
| task data handling in | 181 |
| Physiology, work | |
| caloric values in task sequencing | 557 |
| energy costs and flow during human locomotion | 603 |
| energy expenditure and fatigue | 563 |
| estimates of energy expenditure and heart rate | 581 |
| methods for measurement of oxygen consumption | 587 |
| normal and handicapped people | 567 |
| one-armed and two-armed work | 573 |
| urinary mucoprotein excretion | 595 |
| Pressure | |
| reduced, and performance | 409 |
| suit (Apollo) | 409 |
| Problem solving | |
| aircraft accident investigator | 61 |
| group | 39 |
| Prosthetic devices | 133 |
| Radar, side looking | |
| image quality and target recognition | 5 |
| target identification | 239 |
| Reaction time | |
| and cold | 210 |
| and manual control | 225 |
| Recall, target | 273 |
| Recognition threshold and image variables | 33 |
| Reconnaissance | |
| applications | 239 |
| space | 105 |
| Remote handling | |
| advanced and delayed displays | 127 |
| coordination acquisition | 133 |
| distance judgments with TV presentation | 447 |
| multi-dimensional manipulator control | 133 |
| operator delays | 223 |
| skill acquisition | 133 |
| Repetitive task, servo theory model | 433 |
| Requirements analysis, performance assessment | 325 |
| Research, human engineering | |
| and aerospace simulation | 149 |
| assessment of complex performance | 325 |
| automated human factors task data handling | 181 |
| needs in | 1 |
| null hypothesis in | 321 |
| and task taxonomy | 361 |
| Response, human | |
| devices to increase speed of | 221 |
| flexibility, frequency and speed | 221 |
| Reviews, literature | |
| aerospace simulation | 149 |
| ambient noise and signal detection | 277 |
| automated human factors task data handling | 181 |
| cold and human performance | 203 |
| human operator response | 221 |
| human resources engineering | 517 |
| image quality and target recognition | 5 |
| vigilance and signal detection theory | 285 |
| Safety research | 61 |
| Search performance, and visual acuity | 301 |
| Secondary tasks | |
| measurement | 395 |
| and multi-channel displays | 198 |
| simultaneous voice messages | 45 |
| Series processing system model | 53 |
| Servomechanism theory | |
| human as an adaptive, low pass filter | 141 |
| manual repetitive operation | 433 |
| Signal, bi-sensory | 461 |
| Signal detection | |
| and ambient noise | 277 |
| theory of signal detectability | 285 |
| Simulation | |
| aerospace | 149 |
| flight | 321 |
| flight control | 305 |
| full scale evaluation | 341 |
| legibility testing | 471 |
| manual repetitive operation | 433 |
| multi-channel displays | 192 |
| multi-dimensional manipulator control | 134 |
| and performance assessment | 341 |
| reduced pressure | 409 |
| reconnaissance, space | 108 |
| side looking radar | 239 |
| synthetic tasks | 375 |
| TV display systems | 447 |
| vibration simulator | 95 |
| Size constancy, and dial readability | 419 |
| Skill acquisition, remote manipulator | 133 |
| Sonar equipment | |
| color coded displays | 175 |

| | Page |
|---|---|
| lighting conditions | 175 |
| Space systems | |
| energy expenditure and fatigue | 563 |
| human performance dimensions | 367 |
| pressure suit | 409 |
| reduced pressure and performance | 409 |
| research applications 5, 33, 39, 105, 239, 405, 563 | |
| side looking radar in simulated orbit | 239 |
| simulation and performance measurement | 341 |
| space reconnaissance | 105 |
| recognition of lunar craters | 33 |
| Symbol frequency and legibility | 471 |
| System effectiveness model | 53 |
| System performance and operator tasks | 329, 368 |
| Stress, task induced | 396 |
| Tactical decision making | 258, 541 |
| Tactile sensitivity and cold | 203 |
| Tactual coding (see Coding, tactual) | |
| Target | |
| detection and recall | 273 |
| localization, side looking radar | 239 |
| recognition, aerial photographs | 5 |
| recognition and image quality | 5 |
| recognition, lunar craters | 33 |
| recognition, one and two-man teams | 39 |
| search and number of observers | 39 |
| search strategy | 39 |
| Task data handling research | 181 |
| Task loading | 395 |
| Taxonomy, task | |
| in complex systems | 329 |
| factor analytic | 349, 367 |
| Television, distance judgments | 447 |
| Temperature | |
| cold and human performance | 203 |
| subjective response to thermal balance | 497 |
| Theory (see Models) | |
| Thermal environment | |
| cold and human performance | 203 |
| subjective response to | 497 |
| Threat evaluation | |
| tactical air strike | 541 |
| tactical decision making | 258 |
| Threshold, noise effect on | 277 |
| Threshold, visual recognition | 33 |
| Thumbwheel switch | 479 |
| Tracking | |
| cold and | 203 |
| compensatory, computer-aided | 105 |
| compensatory, manual | 105 |
| compensatory and vibration | 93 |
| cross-adaptive conditions | 395 |
| and display variables | 127 |
| and noise | 141 |
| pursuit | 127 |
| and vibration | 93 |
| Training | |
| by computer-aided instruction | 251 |
| maintenance | 161 |
| Trouble shooting (see Maintenance) | |
| Utility | |
| decisions in tactical decision making | 541 |
| series processing model | 53 |
| in target recall | 273 |
| and workspace layout | 295 |
| Value, and target recall | 273 |
| Vibration, long term effects | 93 |
| Viewing distance | |
| and dial readability | 419 |
| and target recognition | 20 |
| Vigilance | |
| ambient noise and | 278 |
| analysis | 285 |
| monitoring auditory inputs | 45 |
| monitoring, visual distractions | 191 |
| multi-channel displays | 191 |
| simultaneous voice messages | 45 |
| theory of signal detectability | 285 |
| Vision | |
| and ambient noise | 277 |
| and audition, bi-sensory | 461 |
| dark adaptation and color coded displays | 175 |
| degradation in driving | 427 |
| distance judgments | 447 |
| eye travel and instrument layout | 299 |
| far, and search performance | 301 |
| flashing lights | 405 |
| form perception | 439 |
| image quality and target recognition | 5 |
| multi-channel displays | 191 |
| near acuity and search | 301 |
| number legibility | 455 |
| peripheral acuity and search | 301 |
| threshold and image variables | 33 |
| visual acuity stimulus distance | 301 |
| visual signals and noise | 141 |
| Voice messages, simultaneous | 45 |
| Warning systems | |
| vibration and | 93 |
| visual, flashing lights | 405 |
| Weather symbols | 471 |
| Work physiology, Special Issue | 555 |
| Workspace layout (see Layout, Workplace) | |

F 1965